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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/900,777	07/06/2001	Michael K. Brand	12177/21201	7690

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EXAMINER

GEBRESILASSIE, KIBROM K

ART UNIT PAPER NUMBER

2128

DATE MAILED: 01/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/900,777	<b>Applicant(s)</b> BRAND ET AL.	
	<b>Examiner</b> Kibrom K. Gebresilassie	<b>Art Unit</b> 2128	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 18 November 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-9, 11-19, 21 and 22 is/are pending in the application.
- 4a) Of the above claim(s) 10, 4, 20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9, 11-19, 21 and 22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>12/23/2005</u> . | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. Claims 1-9, 11-19, 21, and 22 have been presented for examination based on applicant's amendment filed on 18 November 2005.
2. Claims 10 and 20 are canceled.
3. Claims 1-9, 11-19, 21, and 22 remains rejected by the examiner.

### ***Response to Arguments***

4. Applicants arguments filed on 18 November 2005 have been fully considered.

*Regarding amendments to the specification: The examiner based on the amendment filed on 18 November 2005 has approved Applicant's proposed specification changes.*

*Regarding applicant's response to 101 rejection: the 101 rejection did not overcome by applicants argument and change made. For example, in page 24, the applicant's recite, "...program inputted either manually ..." which clearly shows not an actual data structure, which can arise the issue of non-functional descriptive material.*

*Further, applicant's amended the claims by inserting a computer medium in the claims. A computer medium, which executes to perform the steps, would normally be considered a statutory. However, applicant's fail to define the computer medium is tangible media in the specification.*

*Further, New or amended claims which introduce elements or limitations which are not supported by the as-filed disclosure violate the written description*

*requirement. Based on the reasons mentioned, the examiner maintains the 101 rejection.*

*Regarding applicant's response to 102(a) rejection:*

*Regarding Independent Claims 1, 21, and 22:* Applicant's have argued that the enclosed formula in,  $At = t_1/t_2$  where  $At$  is acceleration factor, and  $t_1$  and  $t_2$  are Mean time to Failure, prior art (ADI Reliability Handbook) is linear. However, applicant's argument relating to claims 1, 21, and 22 are not persuasive. It is clearly shown in the prior art that the acceleration factor,  $At = t_1/t_2 = \exp.[-E_a/k (1/T_{TEST} - 1/T_{USE})]$  where  $T_{TEST}$  and  $T_{USE}$  are Test Acceleration and Use Temperature in Kelvin, is an exponential function which is non-linear.

Further, the examiner has a doubt on the relationship of the limitation that recites " $t_F = AF \times t_A^2$ ". As well known in the art, the acceleration factor  $AF$  is just a number with **no units**. According to the specification of the applicant's,  $t_F$  and  $t_A$  are both indicate the failure time, which their unit will be second (sec). Based on the applicant's formula, it shows clearly that the units of  $t_F$  and  $t_A$  are not equal if acceleration factor is unit less.

$$t_F = AF \times t_A^2, \text{ Let assume } AF=1, \text{ then } t_F = t_A^2 \Rightarrow s \neq s^2$$

Where,

$$t_F = \text{second}(s)$$

$$t_A = \text{second}(s)$$

$$AF = \text{unitless}$$

Based on the above reasons, the examiner maintains the 102(a) rejection of claims 1, 21, and 22.

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1, 21, and 22 are rejected under 35 U.S.C. 112, first paragraph, because

the specification, while being enabling for  $\frac{t_{F2}}{t_{F1}} = \frac{AF \times t_{A2}^2}{AF \times t_{A1}^2} = \frac{t_{A2}^2}{t_{A1}^2}$ , does not reasonably

provide enablement for  $t_F = AF \times t_A^2$ . The specification does not enable any person

skilled in the art to which it pertains, or with which it is most nearly connected, to make

and use the invention commensurate in scope with these claims. *As well known in the*

*art, the acceleration factor AF is just a number with no units. According to the*

*specification of the applicant's,  $t_F$  and  $t_A$  are both indicate the failure time, which their*

*unit will be second (sec). Based on the applicant's formula, it shows clearly that the*

*units of  $t_F$  and  $t_A$  are not equal if acceleration factor is unit-less.*

$$t_F = AF \times t_A^2, \text{ Let assume } AF=1, \text{ then } t_F = t_A^2 \Rightarrow s \neq s^2$$

Where,

$t_F = \text{second}(s)$

$t_A = \text{second}(s)$

$AF = \text{unitless}$

3. Claims 1-9, 11-19, 21, and 22 are rejected under 35 U.S.C. 101 because the claimed invention is not supported by either a specific and substantial asserted utility or a well-established utility.

*For example, in page 24, the applicant's recite, "...program inputted either manually ..." which clearly shows not an actual data structure, which can arise the issue of non-functional descriptive material. Further, a lack of adequate written description issue also arises if the knowledge and level of skill in the art would not permit one skilled in the art to immediately envisage the product claimed from the disclosed process.*

*Further, applicant's amended the claims by inserting a computer medium in the claims. A computer medium, which executes to perform the steps, would normally be considered a statutory. However, applicant's fail to define the computer medium is tangible media in the disclosure.*

*Further, New or amended claims which introduce elements or limitations which are not supported by the as-filed disclosure violate the written description requirement*

Claims 1-9, 11-19, 21, and 22 are also rejected under 35 U.S.C. 112, first paragraph. Specifically, since the claimed invention is not supported by either a specific and substantial asserted utility or a well established utility for the reasons set forth above, one skilled in the art clearly would not know how to use the claimed invention.

Art Unit: 2128

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1, 21, and 22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. For example, as amended claim 1, the applicant's did not specify what the terms  $t_F$ ,  $AF$ , and  $t_A$  stand for.

### ***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

*A person shall be entitled to a patent unless –*

*(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.*

7. Claims 1-9, 11-19, 21, and 22 are rejected under 35 U.S.C. 102(a) as being anticipated by ADI Reliability Handbook, 2000.

#### **As per Claim 1:**

ADI Reliability Handbook teaches determining accelerated stress testing data for the product using the relationship  $t_F = AF \times t_A^2$  (the formula can be rewrite as  $AF = \frac{t_F}{t_A^2}$ )

the accelerated stress testing data representing the response of the product operating

in a first environment (" ,  $At = \frac{t_1}{t_2} = \exp.[-\frac{E_a}{k} (\frac{1}{T_{TEST}} - \frac{1}{T_{USE}})]$  where  $T_{TEST}$  and  $T_{USE}$  are

Art Unit: 2128

*Test Acceleration and Use Temperature in Kelvin,  $A_t$  is acceleration factor, and  $t_1$  and  $t_2$  are Mean time to Failure; and Page 8 Fig. 3)*

Calculating the mean-time-between-failures for the operating in a second environment based on the accelerated stress testing data

Other terms include Mean Time to Failure (MTTF or MTBF) and useful life. MTTF is the time period over which a meaningful portion of the population will have failed. In the case of an exponential distribution with a constant failure rate, around 63% of the population will have failed by the  $MTTF = 1/\lambda$ .", page 10).

**As per Claim 2:**

ADI Reliability Handbook teaches first environment is more likely than the second environment to cause the product to fail ("

Applying these acceleration factors to the data above, the equivalent device hours at 55°C can be calculated for 125°C and 135°C.  
", page 14; Table IV, page 14).

**As per Claim 3:**

ADI Reliability Handbook teaches the accelerated stress testing data represents the length of time the product operates in the first environment before the product to fail (table IV page 14, under column, "*Number Of Device Hrs. at Test Temp*").

**As per Claim 4:**

ADI Reliability Handbook teaches the accelerated stress testing data is derived from a plurality of different stress tests (*Autoclave, JEDEC-STD-22 Method A102 and A101, Temperature Humidity Bias HAST* etc; pages 17-20).

**As per Claim 5:**



ADI Reliability Handbook teaches the plurality of stress tests includes a temperature test ("*Temperature Cycle*" page 19, "*Thermal Shock*" page 20) and a vibration test (*ultrasonic vibration*; page 47, a paragraph starting with "*The Si nodules are formed...*" line 3).

**As per Claim 6:**

ADI Reliability Handbook teaches calculating upper and lower confidence limits for the MTPF calculation (on page 14, "*the confidence intervals normally used are 60% and 90% respectively*" and on page 15, "*At 60% C.I.  $Fr = 1.27 \times 10^{-8}$ ; At 90% C.I.  $Fr = 3.3 \times 10^{-8}$* ").

**As per Claim 7:**

ADI Reliability Handbook teaches accelerated stress-testing data is determined at least in part from BOM information on the product (*Device information: a complete FAIR form, reliability tracking sheet, or other form of documentation which details part type, serial number, date code, and manufacturing lot number*, page 61).

**As per Claim 8:**

ADI Reliability Handbook teaches step of calculating is performed during the design of the product ("*This is achieved through careful planning in the design phases of any new development or equipment instruction...*" page 1, under title "ADI Reliability Charter" lines 4-6).

**As per Claim 9:**

Art Unit: 2128

ADI Reliability Handbook teaches step of calculating is performed prior to manufacturing the product for commercial use (page 9 under a title "*Product Reliability Stressing*" lines 1-5).

**As per Claim 11:**

ADI Reliability Handbook teaches the accelerated stress testing data includes accelerated stress testing data includes accelerated stress testing data for a previous design of a product (page 6 under a title "*Release Phase*" the first paragraph lines 3-6).

**As per Claim 12:**

The limitation of claim 12 has already been discussed in the rejection of claims 2 and 11. It is therefore rejected under the same rationale.

**As per Claim 13:**

The limitation of claim 13 has already been discussed in the rejection of claims 1 and 11. It is therefore rejected under the same rationale.

**As per Claim 14:**

ADI Reliability teaches step of calculating includes using the relationship EXP  $[1/k \sum_{i=1}^k \ln(t_2^2/t_1^2)]$ ; and wherein  $t_1$  = time to first failure during accelerated stress testing for previous design of the product, and  $t_2$  = time to first failure during accelerated stress testing for the product ( $At = t_1/t_2 = \exp.[-E_a/k (1/T_{TEST} - 1/T_{USE})]$ ; page 11).

**As per Claim 15:**

ADI Reliability Handbook teaches calculating a factor increase or decrease in the life of the product as compared to the life of the pervious design of the product (page 6, paragraph one and two of "Release Phase").

**As per Claim 16:**

The limitation of claim 16 has already been discussed in the rejection of claim 4. It is therefore rejected under the same rationale.

**As per Claim 17:**

The limitation of claim 17 has already been discussed in the rejection of claim 5. It is therefore rejected under the same rationale.

**As per Claim 18:**

The limitation of claim 18 has already been discussed in the rejection of claim 8. It is therefore rejected under the same rationale.

**As per Claim 19:**

The limitation of claim 19 has already been discussed in the rejection of claim 9. It is therefore rejected under the same rationale.

**As per Claim 21:**

The limitation of claim 21 has already been discussed in the rejection of claims 1, 2, and 4. It is therefore rejected under the same rationale.

**As per Claim 22:**

The limitation of claim 22 has already been discussed in the rejection of claims 1, 2, and 7. It is therefore rejected under the same rationale.


***Conclusion***

Art Unit: 2128

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

10. Any inquiring concerning this communication or earlier communication from the examiner should be directed to Kibrom K. Gebresilassie whose telephone number is (571) 272-8571. The examiner can normally be reached on Monday-Friday, 8:30 am to 4:30 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner supervisor, Kamini shah can be reached at (571) 272-2279. The official fax number is (571) 273-8300. Any inquiring of a general nature relating to the status of this application should be directed to the group receptionist whose telephone number is (571) 272-3700.

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